

14
paid

forming the second thin film device layer on a second substrate with a separable layer therebetween; and

irradiating the separable layer with light to cause a separation in at least one of the separable layer and at an interface so that the second thin film device layer is transferred to the first substrate.

25. (Amended) The method for manufacturing a three-dimensional device according to claim 21, the second thin film device layer being deposited by transferring being formed simultaneously with at least one other of the thin film device layers.

REMARKS

Claims 1-27 are pending. By this Amendment, claims 1-3, 12, 17, 21 and 25 are amended.

The attached Appendix includes marked up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Reconsideration based on the following remarks is respectfully requested.

I. The Claims Satisfy All Formal Requirements

The Office Action objects to claims 2, 3, 14 and 18-21 based on informalities. Claim 2 is amended to obviate the objection to that claim. The objection to the remaining claims is respectfully traversed.

Regarding the objection to claim 3, the Office Action asserts that "and" should be replaced with --or-- in line 5 of the claim. Claim 3 recites that separation is caused in at least one of the separable layer and at an interface. That is, the separation is caused either in the separable layer, at an interface, or in the separable layer and at the interface. The "in at least one of...and..." language in claim 3 properly claims this feature.

Regarding claim 14, the Office Action asserts that claim 14 is a substantial duplicate of claim 15. However, claim 14 is not a substantial duplicate of claim 15 because claim 14

provides coverage for the situation in which only one of the thin film device layers comprises a memory cell array. Claim 15 specifically recites that a plurality of layers comprises one memory.

Regarding the rejection of claims 18-20, the Office Action asserts that these claims are of improper dependent form for failing to further limit the subject matter of a previous claim. Specifically, the Office Action asserts that the steps recited in claims 18-20 are inherent because different structures are formed which are of different sizes. However, it is not inherently known to make a logic circuit and a memory cell with different design rules, different design parameters, or by a different fabricating process in the same three dimensional device. Claims 18-20 are drawn to a specific feature of the invention that provides advantages over the conventional method of forming a three dimensional device.

The Office Action asserts that claim 21 is a substantial duplicate of claims 1 and 3. The Office Action is correct that claim 21 claims features similar to those claimed by claim 1 combined with claim 3. However, claims 1 and 21 are separate and independent claims that, if allowed, would provide different scope of protection. Thus, the difference between claims 1 and 21 is not a mere slight difference in wording, and thus these two claims can be properly included in this application.

Withdrawal of the objection to the claims is respectfully requested.

II. The Claims Satisfy the Requirements of 35 U.S.C. § 112, Second Paragraph

The Office Action rejects claims 3, 12 and 15 under 35 U.S.C. §112, second paragraph as being indefinite. Claim 3 is amended to obviate the rejection of that claim. The rejection to claims 12 and 15 under 35 U.S.C. §112, second paragraph is respectfully traversed.

Regarding claims 12, the Office Action does not state specific reasons why the claim does not satisfy the requirements of 35 U.S.C. §112, second paragraph. Thus, it appears this rejection was made in error.

The Office Action asserts that the use of the term "one memory" in claim 15 is indefinite. Claim 15 clearly recites that a plurality of layers makes up the one memory. Thus, claims 15 is clear and definite.

Withdrawal of the rejection under 35 U.S.C. §112, second paragraph is respectfully requested.

III. The Claims Satisfy the Requirements of 35 U.S.C. § 101

The Office Action rejects claim 17 under 35 U.S.C. §101 and under 35 U.S.C. §112, second paragraph because it improperly embraces or overlaps two different statutory classes of invention, namely, method of making a device and process of using the device. Claims 17 is amended to obviate this rejection. Withdrawal of the rejection under 35 U.S.C. §101 is respectfully requested.

IV. The Claims Define Patentable Subject Matter

The Office Action rejects claims 1-27 under 35 U.S.C. §103(a) over Hayashi (U.S. Patent No. 5,087,585) in view of Vu et al. (U.S. Patent No. 5,499,124). This rejection is respectfully traversed.

Hayashi, whether alone or in combination with Vu, does not disclose or suggest a method of forming a three-dimensional device including, inter alia, irradiating a separable layer with light to cause a separation, such that a second thin film device layer is transferred to a first substrate, and formed on a first thin film device layer.

Instead, Hayashi discloses a three-dimensional device in which a top, or second, device layer is transferred from another substrate. However, Hayashi's method uses etching to transfer the top device layer, not irradiation, as in the claimed invention.

The Office Action attempts to make up for the deficiencies of Hayashi by combining Hayashi with Vu. However, Vu also does not disclose the claimed method.

Instead, Vu discloses a process in which a first layer is transferred to another substrate by irradiating light, and does not disclose the use of a second layer. That is, Vu does not disclose transferring a second device layer to a first substrate such that the second device layer is formed on a first device layer.

Even when combined, Vu and Hayashi would not have made the invention obvious to one having ordinary skill in the art. Such a combination would simply provide a method in which a bottom (first) device layer is formed on a substrate by a separation method with irradiating light, and a top (second) device layer is formed on the bottom device layer by separation with etching. That is, the combination does not disclose a second thin film device layer formed by separation with light.

For at least these reasons, it is respectfully submitted that claims 1, 2 and 21 are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed as well as for the additional features they recite. Applicants respectfully request that the rejection under 35 U.S.C. 103 be withdrawn.

V. Conclusion

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

B. A. O.

James A. Oliff
Registration No. 27,075

Benjamin M. Halpern
Registration No. 46,494

JAO:BMH/gpn

Attachments:

Appendix
Petition for Extension of Time

Date: August 26, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE
AUTHORIZATION
Please grant any extension
necessary for entry;
Charge any fee due to our
Deposit Account No. 15-0461



APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claim(s):

1. (Three Four Times Amended) A method of forming a three-dimensional device, the device including at least a first thin film device layer and a second thin film device layer, each deposited in a thickness direction having a plurality of thin film device layers deposited in a thickness direction, and a first substrate, each thin film device layer being disposed in a predetermined region in a planar direction, the method comprising:

forming the first thin film device layer on a first substrate;
forming the second thin film device layer on a second substrate with a separable layer therebetween; and
irradiating the separable layer with light to cause a separation, such that the second thin film device layer is transferred to the first substrate, and formed on the first thin film device layer

depositing at least one of the thin film device layers by a separation in a separable layer on which the at least one thin film device layer is formed.

2. (Three Four Times Amended) The A method of forming a three-dimensional device, the device including at least a first thin film device layer and a second thin film device layer constituting a three-dimensional circuit, each thin film device layer deposited in a thickness direction, having a plurality of thin film device layers deposited on a base in a thickness direction for constituting a three-dimensional circuit, each thin film device layer constituting a circuit disposed in a predetermined region extending in a planar direction, the method comprising:

depositing ~~at least one of the second~~ thin film device ~~layers~~ ~~layer~~ by a separation in a separable layer on which the ~~at least one~~ ~~second~~ thin film device layer is formed.

3. ~~(Three~~ Four Times Amended) The method of forming a three-dimensional device according to claim 1, further comprising ~~forming the at least one thin film device layer on a second substrate with the separable layer therebetween; and~~

~~irradiating the separable layer with light to cause a separation in at least one of the separable layer and at an interface between the separable layer and the second substrate so that the at least one~~ ~~second~~ thin film device layer on the second substrate is transferred to the first substrate of the three-dimensional device.

12. ~~(Twice~~ Three Times Amended) The method of forming a three-dimensional device according to claim 1, the ~~at least one~~ ~~second~~ thin film device layer deposited by transferring being formed simultaneously with ~~at least one other of the thin film device layers.~~

17. ~~(Twice~~ Three Times Amended) The method of forming a three-dimensional device according to claim 16, the logic circuit being capable of driving the memory cell array.

21. (Twice Amended) A method for manufacturing a three-dimensional device having a plurality of thin film device layers on a first substrate, the plurality of thin film device layers including at least a first thin film device layer and a second thin film device layer, the method comprising:

forming at least one ~~the~~ second thin film device layer on a second substrate with a separable layer therebetween; and

irradiating the separable layer with light to cause a separation in at least one of the separable layers-layer and at an interface so that the ~~at least one~~second thin film device layer is transferred to the first substrate.

25. (Amended) The method for manufacturing a three-dimensional device according to claim 21, the ~~at least one~~second thin film device layer being deposited by transferring being formed simultaneously with at least one other of the thin film device layers.